

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of: Yumin Liu

Application No.: To be assigned

Group Art Unit: 1764

Filed: Herewith

Examiner: T. Nguyen

For: **PROCESSES FOR OXIDATIVE  
DEHYDROGENATION**

Attorney Docket No.: 10460-013-999

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicants respectfully request entry of this Preliminary Amendment. For the convenience of the Examiner, the pending Claims after entry of this amendment are enclosed in an Appendix.

**AMENDMENT**

**IN THE CLAIMS**

Please cancel Claims 16-66 without prejudice.

Please amend Claims 1, 5, 6, 10, 11, 15, and 67 to read as follows:

1. (Once Amended) A method comprising contacting an alkane having from 2 to 4 carbon atoms to a catalyst that includes at least about 50% nickel oxide and dehydrogenating said alkane with a selectivity of greater than 70% and a conversion of greater than 10%.

5. (Once Amended) The method of claim 1 wherein said conversion is greater than 15%.

6. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising contacting said alkane in the presence of oxygen to a compound that includes nickel oxide at a temperature of less than or equal to about 400 °C and obtaining a selectivity in said dehydrogenation of greater than 70% and a conversion of greater than 10%.

10. (Once Amended) The method of claim 6 wherein said conversion is greater than 15%.

11. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising  
contacting a gas mixture comprising said alkane and oxygen to a catalyst that includes at least about 50% nickel oxide; and  
obtaining a selectivity greater than 70% and a conversion greater than 10%.

15. (Once Amended) The method of claim 11 wherein said conversion is greater than 15%.

67. (Once Amended) A method for the oxidative dehydrogenation of ethane to ethylene, optionally with ethylene as a co-feed with said ethane, comprising contacting ethane to a catalyst that includes at least about 50% nickel oxide (NiO) with either niobium oxide (Nb<sub>2</sub>O<sub>5</sub>) or tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>).

#### **REMARKS**

With this Amendment, Claims 1, 5, 6, 10, 11, 15 and 67 have been amended and Claims 16-66 have been canceled without prejudice. Thus, after entry of this Amendment, Claims 1-15 and 67 are pending in the instant Application. Applicant expressly reserves the right to prosecute claims drawn to canceled subject matter in one or more continuation, divisional or continuation-in-part applications.

### AMENDMENT OF CLAIMS

Claims 1, 6 and 11 have been amended to clarify the invention recited in these claims. Support for the amendment of Claims 1 and 11 can be found in the Specification at page 5, lines 21-23. Support for the amendment of Claim 6 can be found in the Specification at page 7, lines 23-26. Claims 5 and 10 and 15 have been amended to correct a typographical error.

No new matter is added by the amendment of Claims 1, 5, 6, 10, 11, 15, and 67. Accordingly, entry into the instant Application is proper and respectfully requested.

### CONCLUSION

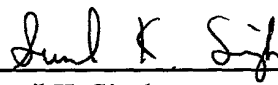
Applicant respectfully submits that all pending Claims of the captioned Application satisfy all requirements for patentability and are in condition for allowance. An early indication of the same is therefore respectfully requested.

No fees are believed due in connection with this Preliminary Amendment. However, the Commissioner is authorized to charge any required fee not included with this Amendment or credit any overpayment to Pennie & Edmonds LLP Deposit Account No. 16-1150. A duplicate copy of this sheet is enclosed for such purpose.

If the Examiner determines that prosecution of the instant application would benefit from a telephone interview, the Examiner is invited to call the undersigned attorney at (212) 790-6578.

Respectfully submitted,

Date March 22, 2001

  
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Enclosure

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No new matter is added by the amendment of Claims 1, 5, 6, 10, 11, 15, and 67. Accordingly, entry into the instant Application is proper and respectfully requested.

### CONCLUSION


Applicant respectfully submits that all pending Claims of the captioned Application satisfy all requirements for patentability and are in condition for allowance. An early indication of the same is therefore respectfully requested.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. (Once Amended) A method comprising contacting [at least] an alkane having from 2 to 4 carbon atoms to a catalyst [comprising at least] that includes at least about 50% nickel oxide and dehydrogenating said alkane with a selectivity of greater than 70% and a conversion of greater than 10%.

5. (Once Amended) The method of claim 1 wherein said conversion is greater [that] than 15%.

6. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising contacting said alkane in the presence of oxygen to a compound [comprising] that includes nickel oxide at a temperature of less than or equal to about 400 °C and obtaining a selectivity in said dehydrogenation of greater than 70% and a conversion of greater than 10%.

10. (Once Amended) The method of claim 6 wherein said conversion is greater [that] than 15%.

11. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising  
contacting a gas mixture comprising said alkane and oxygen to a [nickel oxide containing] catalyst that includes at least about 50% nickel oxide; and  
obtaining a selectivity greater than 70% and a conversion greater than 10%.

15. (Once Amended) The method of claim 11 wherein said conversion is greater [that] than 15%.

67. (Once Amended) A method for the oxidative dehydrogenation of ethane to ethylene, optionally with ethylene as a co-feed with said ethane, comprising contacting ethane to a catalyst [comprising] that includes at least about 50% nickel oxide (NiO) with either niobium oxide (Nb<sub>2</sub>O<sub>5</sub>) or tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>).

## Appendix

1. (Once Amended) A method comprising contacting an alkane having from 2 to 4 carbon atoms to a catalyst that includes at least about 50% nickel oxide and dehydrogenating said alkane with a selectivity of greater than 70% and a conversion of greater than 10%.

2. The method of claim 1 wherein said selectivity is greater than 75%.

3. The method of claim 2 wherein said selectivity is greater than 80%.

4. The method of claim 3 wherein said selectivity is greater than 85%.

5. (Once Amended) The method of claim 1 wherein said conversion is greater than 15%.

6. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising contacting said alkane in the presence of oxygen to a compound that includes nickel oxide at a temperature of less than or equal to about 400 °C and obtaining a selectivity in said dehydrogenation of greater than 70% and a conversion of greater than 10%.

7. The method of claim 6 wherein said selectivity is greater than 75%.

8. The method of claim 7 wherein said selectivity is greater than 80%.

9. The method of claim 8 wherein said selectivity is greater than 85%.

10. (Once Amended) The method of claim 6 wherein said conversion is greater than 15%.

11. (Once Amended) A process for the oxidative dehydrogenation of an alkane having from 2 to 4 carbon atoms comprising

contacting a gas mixture comprising said alkane and oxygen to a catalyst that includes at least about 50% nickel oxide; and

obtaining a selectivity greater than 70% and a conversion greater than 10%.

12. The method of claim 11 wherein said selectivity is greater than 75%.

13. The method of claim 12 wherein said selectivity is greater than 80%.

14. The method of claim 13 wherein said selectivity is greater than 85%.

15. (Once Amended) The method of claim 11 wherein said conversion is greater than 15%.

67. (Once Amended) A method for the oxidative dehydrogenation of ethane to ethylene, optionally with ethylene as a co-feed with said ethane, comprising contacting ethane to a catalyst that includes at least about 50% nickel oxide (NiO) with either niobium oxide ( $\text{Nb}_2\text{O}_5$ ) or tantalum oxide ( $\text{Ta}_2\text{O}_5$ ).